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(412) The Perup : a living forest
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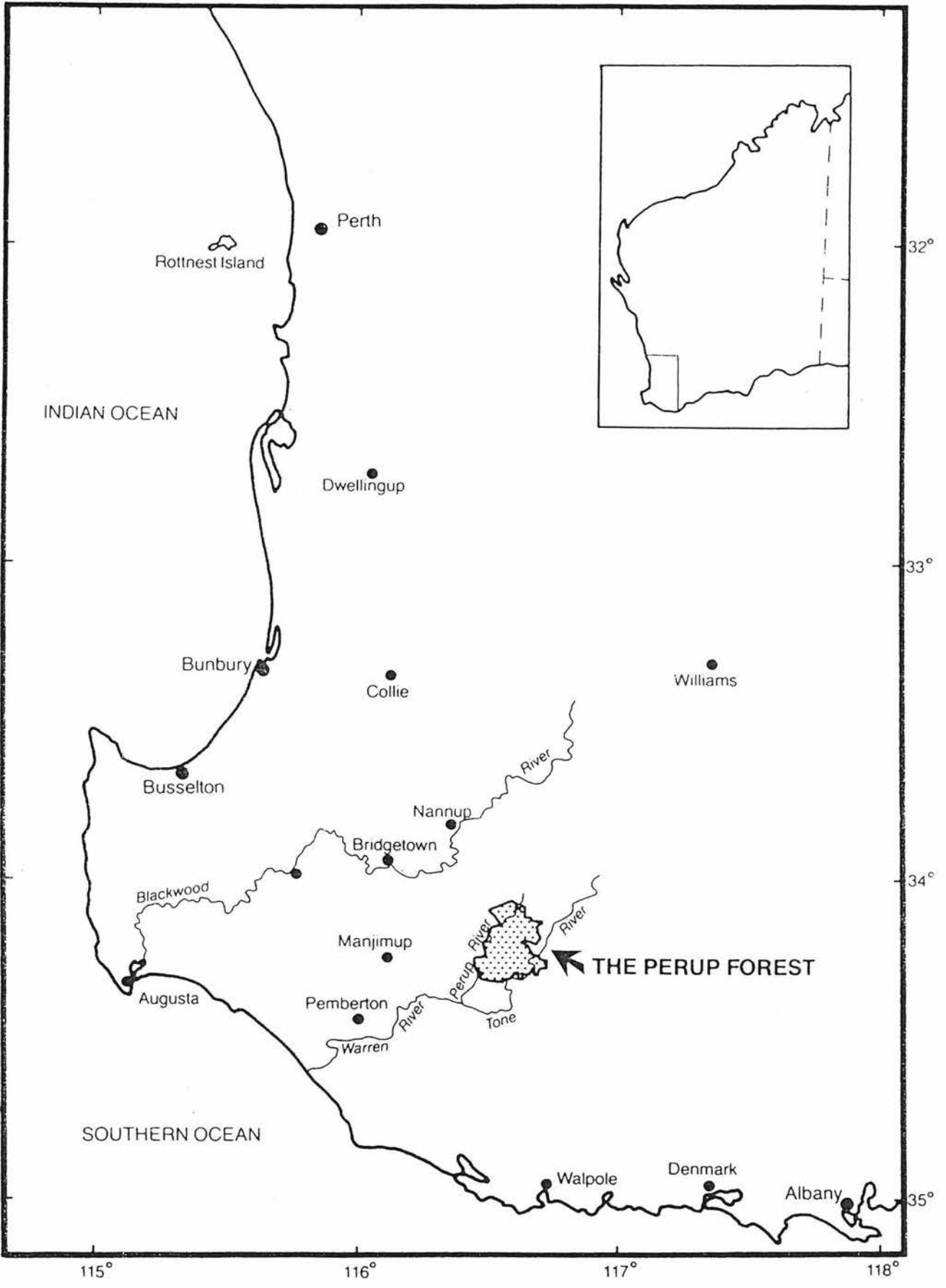
PERUP ing forest

PARTMENT OF ENVIRONMENT AND CONSERVATION



DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT

PERUP FOREST LOCATION MAP



INTRODUCTION

The Perup forest contains more species of mammals than any similar sized area in the south-west of Western Australia. Viable populations of at least six rare and endangered mammals exist within the area. For this reason the Perup is a proposed nature reserve.

The Perup Field Ecology Centre is located 50km ENE of Manjimup on an old farm which has been incorporated into the surrounding State forest. Over the past few years the centre has been used as a base for community education courses aimed at raising awareness of forest management issues.

Studies of forest ecology and the experimental application of management techniques are carried out in the 40,000 ha Perup Forest.

HISTORICAL

The Perup area was set aside in 1971 as a Forests Department Management Priority Area for flora and fauna. Prior to this little was known about the fauna of the area except the District Manager of Manjimup at the time, Allister Mather, knew of some small "wallaby" things in the Perup bush. One of his foresters, Harry Winfield, showed us the tracks of these small "wallaby" things (Tamar Wallaby) and also showed us some possum trees.

Spotlight surveys and trapping shortly afterwards showed many of these small "wallaby" things (tammars), some smaller "wallaby" things (woylies), numerous possums (brushtail and ringtail) plus many other species of native mammal. From the results of this trapping and spotlighting the boundaries of the Perup reserve were defined and today we have a reserve which covers ~~40,000~~ ^{52,000} ha.

Since that time much research on the fauna of the area has been carried out by the Forests Department and later Department of Conservation and Land Management. Most research has centred around the effects of fire on flora and fauna. Though the prime reason for most of this research has been to study the effects of prescribed burning practices, the major thrust has been on the fire ecology of species rather than the immediate effects of cool spring fires, the current practise by CALM.

These studies provide understanding of the role that fire plays in the ecology of the communities which occur in the Perup. As well as being able to predict the effects of prescribed fire on plants and animals, this information may enable forest scientists to formulate fire management plans more suitable to the species of the area.

Much of the work has been written up and is published in journals, scientific papers and various pamphlet listed under references, some of which have been included in this booklet.

GEOGRAPHY

The Perup area lies between the head waters of the Perup and Tone Rivers, tributaries of the Warren River. It is undulating country, typical of the upper reaches of rivers in the south-west and is characterized by broad, flat valleys and low ridges. The rainfall is low, less than 800mm p.a. and streams and swamps in the area are seasonal.

GEOLOGY

The Perup is extremely ancient in geological terms. The area is underlain with rock dating back to the Archean era which is the period prior to any fossil evidence (Pre-Cambrian times). These rocks are mostly granites and gneiss¹ and are considered to be the core of the Australian continent. In places there has been more recent intrusions occurring in the quaternary period.

Sands occur around the margins of swamps. Yellow podsollic (leached) soils occur along the drainage lines while the ridges are sandy gravels with occasional boulders and sheets of laterite. Laterite is a relatively recent occurrence resulting from weathering when the climate of Australia was wet and tropical. With an abundance of vegetation supplying organic acids to the rain water, there was active decomposition of rock forming minerals. The dissolved portions would be carried down into the subsoil where it would be deposited as an impervious hardpan or crust. As the climate became increasingly more arid, the soils above the crust (now mostly sandy material) were stripped off by winds leaving the pavement of laterite.

VEGETATION

The predominant vegetation of the area is an open forest of jarrah (*Eucalyptus marginata*) and marri (*E. calophylla*). Jarrah tends to be dominant on the ridges and the lateritic soils, whereas marri is more common in the valleys and on the sandier soils. Wandoo (*E. wandoo*) woodlands occur in many of the valleys, especially on clay soils in the northern parts of the area.

The understorey over most of the Perup is of low clumped scrub species. Species which are able to continually regenerate from a root stock, such as *Hakea lissocarpa*, *Leucopogon capitellatus* and *Bossiaea ornata* are common on the ridges. In lower lying areas, particularly on sandy soils, *Hypocalymma angustifolia* is dominant. In the treeless drainage lines on shallow soils *Hakea prostrata*, *H. varia* and *Acacia saligna* form tall open thickets. In some areas, particularly along the upper parts of the Perup river, *Melaleuca viminea* forms dense thickets. The wandoo woodlands have a sparse understorey with much bare ground between occasional shrubs.

A few restricted habitats occur with more specialized vegetation. These include granite outcrops with *Casuarina heugeliana*, *C. humilis*, *Hakea cuclocarpa* and *Dryanda ornata*, and several peaty swamps with reedbeds of *Cladium reticulatum* surrounded by woodland of *Banksia attenuata*, flooded gum (*E. rudis*) and *Melaleuca preissii*.

Several leguminous species form dense thickets following summer fires - *Gastrolobium bilobum* (heartleaf poison), *G. spinosum* (prickly poison) and *Acacia pulchella*. Many thickets of heartleaf originating from the 1951 wildfires existed in the more fertile valleys, particularly in the south of the area. Prickly poison thickets occur on shallow soil over granite outcrops and *A. pulchella* forms low thickets in many places following summer or autumn fires. These thickets of 'fireweed' species are important for several species of mammals in the area.

A list of plant species collected from the area is presented in Appendix 1.

ANIMALS

There are three groups of mammals, they are the egg-laying Monotremes; the Marsupials, which give birth to small "embryonic" young; and the placentals, which nourish their embryo by means of a placenta and give birth to young that are fully formed. All mammals are readily distinguished from reptiles by being warm-blooded, feed their young milk, and possessing hair.

The area is outstanding primarily because of its diverse mammal fauna (all three groups are found here) and the high number of rare and endangered species it contains (6).

There is known to be a total of 21 native and 5 introduced species of mammals, 85 species of birds, 8 species of frogs, 4 snakes, and 9 lizards recorded in the area (Appendix 2). This list is not considered to be complete and more species of birds and reptiles are likely to be recorded in future. You may even find yourself collecting the first recorded specimen for the area.

The largest existing population of the woylie (*Bettongia penicillata*), estimated to number less than 5,000 individuals lives in the area. The woylie occurs throughout most of the area. Particularly on the more fertile sandy gravels where the ground cover is comparatively dense.

The numbat (*Myrmecobius fasciatus*) is also widely distributed but far less common. The total population of this species within the area is estimated to number less than 1,000 animals.

The chudich, western native-cat (*Dasyurus geoffroii*) is also widely distributed. Although uncommon, it appears the population is stable.

The tammar wallaby (*Macropus eugenii*) is restricted to the thickets of heartleaf and *Melaleuca viminea* mentioned previously and is comparatively common in the northern and southern parts of the area, where these thickets exist.

The western ringtail possum (*Pseudoncheirus peregrinus*) exists in low numbers over much of the area. This shy and rarely trapped animal is quite often seen whilst spotlighting.

The brown bandicoot (*Isodon obesulus*) also exists in low numbers over much of the area especially where the scrub is thick. You can often see this delightful animal around the house in the evening.

All these species are now on the rare and endangered species list and are the primary reason for the special status of the area.

In 1973/74 many species of fauna in the area suffered a drastic decline in population and it is believed that the introduction of the fox was responsible. Forest Focus Number 23 provides interesting reading on this subject and it is included in the appendices.

RESEARCH

Since the early 1970's biological research has been particularly concerned with the rare and endangered species. Some of the details of this research can be found in the various papers and journals listed under further reading and included with this booklet.

Kangaroo and brush wallaby (*Macropus irma*) populations are monitored twice yearly along a transect through the area. The possum populations are also monitored twice yearly along transects, using spotlights. Other mammals e.g. chudich are trapped on a regular basis as a part of a capture, mark and release programme.

In addition to these monitoring programmes, more detailed studies on species biology, particularly in relation to fire, have been carried out on the woylie and tammar wallaby. These studies are still in progress and detailed investigations are being carried out into the relationship between 'tammar thickets' and fire. Artificial establishments of these thickets, by planting and sowing, is also being investigated.

Further work on the woylie, the establishment of new colonies in other areas of State Forest and the role of the fox as a predator are also receiving attention.

As well as these studies, work has been done on the biology of the numbat and some work has been done on the fire ecology of possums, the chudich and bird communities in the area.

In addition to the research on the animals, studies are being carried out on the vegetation of the area in relation to its response to fire. Permanent plots with different fire treatments have been established to look at the effect of half rotation, normal rotation and double rotation burns. In addition, there are plots of no burns and plots of one burn only, there is also the season of the burn being studied; ie spring, summer or autumn fires. A map showing the layout of the plots is included and we will have a look at the plots in the field.

MANAGEMENT OF THE AREA

All research carried out within the area is of value as basic ecological data. However, the main reason for most of the research relates to the fire ecology of the Perup and the populations of animals which exist there. Fire control is considered basic to the management and protection of the area and the surrounding farmland.

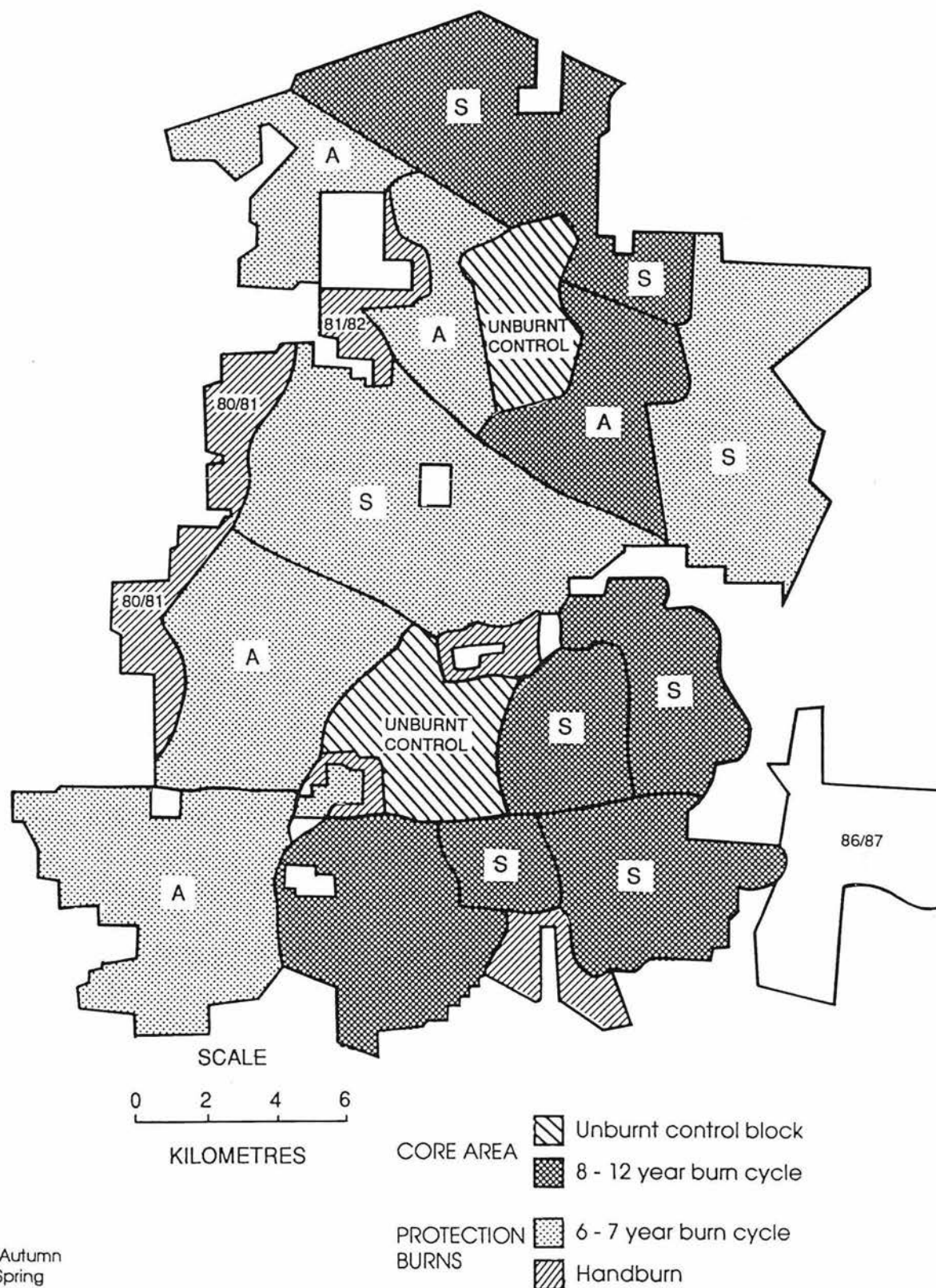
No information on the fire history of the area is available prior to 1938. From that time however, records indicate that the Perup suffered frequent wildfires during summer and autumn months. It was common practice for the farmers in the area to burn on the forest perimeter, and uncontrolled fires often continued to burn in the adjacent bush for long periods.

In 1951 an exceptionally severe wildfire burnt the entire area, leaving the trees scorched and leafless. The extensive thickets of heartleaf, the main home of the tamar, originated as a result of this fire.

Fuel reduction burning was introduced in the late 1950s and by the mid 1960s the area was under a regular 5-7 year cycle of prescribed spring burning, formulated to account of the fauna values of the area. It included two large unburnt (control) areas and one area which allows for alternate spring and autumn burns on a longer cycle and includes special protective burning buffer zones.

This present burning plan is a compromise between protection of the forest area (as well as the surrounding farming areas) and protection of the fauna as indicated by the results of research findings. Some of the details of this burning plan, the philosophy and research findings upon which it is based are outlined in an article in Forest Focus No. 25.

The broad aim in the Perup is to integrate other uses of the forest with the management of the area for flora and fauna. Fire protection plays a major role but other aspects such as wood production and the use of the area for scientific study are also considered important. It is not a 'natural museum'. It is a place where active and positive management of the area's biological resource is taking place in a rational and practical manner. It is a living forest.



Burning plan for the Perup. The two special "core" (high fauna value) areas, one in the north, the other in the south, form the basis of the plan. Protection is provided by buffer zones which are burnt in a shorter rotation. In addition the blocks are burnt on rotation in different seasons which is designed to provide added protection and increases the habitat diversity.

FURTHER READING

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Fire and the Australian Biota. In 'Ecological Biography in Australia'. W.Junk.

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Fire Management in Western Australia. Special Focus No. 1.

POLYPODIACEAE

Cheilanthes tenuifolia
Lindsaya linearis
Pteridium esculentum

CYCADACEAE

Macrozamia reidlei

PODOCARPACEAE

Podocarpus drouyniana

GRAMINAE

Danthonia pilosa
Poa caespitosa
Vulpia bromoides

CYPERACEAE

Cyathochaete avenacea
Gahnia trifida
Lepidosperma angustatum
Lepidosperma brumoniquum
Lepidosperma longitudinale
Mesomelaena uncinata
Mesomelaena tetragona

RESTIONACEAE

Anarthria prolifera
Loxocarya fasciculata
Loxocarya flexuosa

PHILYDRACEAE

Pritzelia pygmaea

JUNCACEAE

Juncus pallidus

LILIACEAE

Agrostocrinum scabrum
Borya nitida
Burchardia sp.
Johnsonia lupulina
Stypandra imbricata
Sowerbaea laxiflora
Dianella revolutos
Chamaescilla corymbosa

XANTHORRHOEACEAE

Dasypogon bromeliaefolius
Lomandra endlicheri
Lomandra sp.
Xanthorrhoea gracilis
Xanthorrhoea preissii

HAEMODORACEAE

Anigozanthos bicolor
Anigozanthos flavida
Anigozanthos manglesii
Conostylis setigera
Hypoxis occidentalis
Tribonanthes australis

IRIDACEAE

Patersonia occidentalis
Patersonia juncea

ORCHIDACEAE

Acianthus reniformis
Acianthus reniformis var. *huegelii*
Caladenia barbarossae
Caladenia deformis
Caladenia flava
Caladenia gemmata
Caladenia huegelii
Caladenia latifolia
Caladenia macrostylis
Caladenia menziesii
Caladenia patersonii
Caleana migrita
Diuris laxiflora
Diuris emarginata
Drakea glyptodon
Corybas dilitatus
Elythranthera brunnonis
Elythranthera emarginata
Eriochilus dilatatus
Lyperanthus serratus
Lyperanthus nigricans
Microtis alba
Prasophyllum fimbria
Prasophyllum parviflorum
Pterostylis barbata
Pterostylis nana
Pterostylis recurva
Thelymitra crinita
Thelymitra fuscolutea
Thelymitra pauciflora
Thelymitra villosa

CASUARINACEAE

Casuarina humilus
Casuarina huegeliana

PROTEACEAE

Ademanthos obovata
Banksia grandis
Banksia littoralis
Banksia sphaerocarpa
Conospermum caeruleum
Conospermum flexuosum
Dryandra armata
Dryandra bipinnatafida
Dryandra nivea
Dryandra sessilis
Grevillea pilulifera
Grevillea pulchella
Grevillea quercifolia
Hakea amplexicaulis
Hakea incrassata
Hakea lissocarpa
Hakea oleifolia
Hakea prostrata
Hakea ruscifolia
Hakea trifucata

Hakea undulata
 Hakea varia
 Persoonia longifolia
 Petrophile longifolia
 Petrophile serruriae
 Synaphea favosa
 Synaphea petiolaris
 Synaphea preissii
 Synaphea reticulata
 Stirlingia simplex

SANTALACEAE

Leptomera cunninghamii

OLEACEAE

Olax benthamii

POLYGONACEAE

Muehlenbeckia adpressa

AMARANTACEAE

Trichinum manglesii

AIZOACEAE

Carpobrotus aequilateralis

RANUNCULACEAE

Clematis pubescens
 Ranunculus colonorum

DROSERACEAE

Drosera bulbosa
 Drosera gigantea
 Drosera stolonifera
 Drosera sulphurea

ROSACEAE

Acaena ovina

PITTOSPORACEAE

Billardiera floribunda
 Billardiera parviflora
 Billardiera varifolia
 Sollya fusiformis

MIMOSACEAE

Acacia browniana
 Acacia diptera
 Acacia drummondii
 Acacia extensa
 Acacia incurva
 Acacia insoliata
 Acacia latipes
 Acacia microbotrya
 Acacia myrtifolia
 Acacia nervosa
 Acacia pentadenia
 Acacia pulchella
 Acacia saligna
 Acacia stenoptera
 Acacia urophylla
 Acacia wildenowniana

CAESALPINIACEAE
Labichea punctata

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PAPILIONACEAE

Bossiaea eriocarpa
Bossiaea linophylla
Bossiaea ornata
Brachysema praemorsum
Brachysema sericeum
Chorizema aciaulare
Chorizema ilicifolium
Chorizema rhombeum
Daviesia cordata
Daviesia incrassata
Daviesia preissii
Daviesia rhombifolia
Gastrolobium bilobum
Gastrolobium spinosum
Gastrolobium villosum
Gompholobium burtonioides
Gompholobium knightianum
Gompholobium ovatum
Goodia latifolia
Hardenbergia comptoniana
Hovea chorizemifolia
Hovea elliptica
Hovea trisperma
Isotropis cuneifolia
Jacksonia furcellata
Kennedyia coccinea
Kennedyia prostrata
Mirbelia scabra
Oxolobium linearfolium
Pultenaea ericifolia
Pultenaea ochreatea
Sphaerolobium medium
Sphaerolobium sp.
Viminaria juncea

OXALIDACEAE

Oxalis corniculata

RUTACEAE

Boronia crenulata
Boronia spathulata
Eriostemon modiflorus

TRENANDRACEAE

Platytheca verticillata
Tetratheca affinis
Tetratheca setigera

POLYGLACEAE

Comesperma confertum
Comesperma volubile

EUPHORBIACEAE

Beyeri sp.
Phyllanthus calycinus
Poranthera huegelii
Ricinocarpus glaucus

LINACEAE

Linum marginale

RHAMNACEAE

Cryptandra pungens
Trymalium ledifolium
Trymalium spathulatum

STACKHOUSIACEAE

Stackhousia brunonis
Stackhousia huegelii

STERCULIACEAE

Thomasia grandiflora
Thomasia pauciflora
Thomasia purpurea

DILLENIAEAE

Hibbertia amplexicaulis
Hibbertia cuneiformis
Hibbertia pulchra
Hibbertia quadricolor
Hibbertia rhadinopoda
Hibbertia stellaris

VIOLACEAE

Hybanthus floribundus

THYMELAEACEAE

Pimelea nervosa
Pimelea rosea
Pimelea suaveolens
Pimelea sylvestris

MYRTACEAE

Actinodium cunninghamii
Agonis linearifolia
Agonis parviceps
Astartea fascicularis
Calothamus lateralis
Calothamus sanguineus
Calythrix brachyphylla
Calythrix flavescens
Eucalyptus calophylla
Eucalyptus cornuta
Eucalyptus decipiens
Eucalyptus marginata
Eucalyptus patens
Eucalyptus rudis
Eucalyptus wandoo
Hypocalymna angustifolium
Kunzea micrantha
Kunzea recurva
Leptospermum ellipticum
Leptospermum erubescens
Melaleuca acerosa
Melaleuca hamulosa
Melaleuca incana
Melaleuca lateritia
Melaleuca parviflora
Melaleuca polygaloides
Melaleuca raphiophylla
Melaleuca scabra
Melaleuca thymoides

Melaleuca viminea
Verticordia habrantha
Verticordia pennigera

HALORRHAGACEAE

Glischrocaryon aureum
Glischrocaryon sp.

APIACEAE

Daucus glochidiatus
Pentapeltis silvatica
Platysace compressa
Platysace tenuissima
Trachymene pilosa
Xanthosia atkinsoniana
Xanthosia candida

EPACRIDACEAE

Andersonia caerulea
Astroloma ciliatum
Brachyloma preissii
Leucopogon australis
Leucopogon capitellatus
Leucopogon concinnus
Leucopogon distans
Leucopogon glabellus
Leucopogon ovalifolius
Leucopogon propinquis
Leucopogon pulchellus
Leucopogon verticillatus
Lysinema ciliatum
Sphenotoma capitatum
Styphelia tenuiflora

LOGANIACEAE

Logania serpyllifolia

GENTIANACEAE

Centaurium australe

LABIATAE

Hemiandra pugens
Hemigenia incana
Hemigenia sp.

SCROPHULARIACEAE

Veronica plebeia

LOBELIACEAE

Lobelia rhombifolia
Lobelia tenuior

GOODENIACEAE

Leschenaultia biloba
Leschenaultia formosa
Scaevola longifolia
Scaevola striata
Vellia trinervis

STYLIDIACEAE

Levenhookia pusilla
Stylidium adnatum
Stylidium brunonianum
Stylidium calcaratum
Stylidium caespitosum
Stylidium caricifolium
Stylidium ciliatum
Stylidium emarginatum
Stylidium rehems
Stylidium schoenoides
Stylidium sp.

ASTERACEAE

Athrixia sp.
Brachycome iberidifolia
Craspedia glauca
Craspedia uniflora
Gnaphalium luteo-album
Helichrysum ramosum
Helichrysum bracteatum
Helipterum cotula
Lagenophora huegelii
Olearia cassineae
Podolepis lessonii
Senecio lautus
Senecio minimus
Waitzia citrina

MAMMALS

Monotremes

Echidna (*Tachyglossus aculeatus*)

Carniverous Marsupials

- * Native Cat (*Dasyurus geoffroii*)
- Brush-tail Phascogale (*Phascogale tapoatafa*)
- Mardo (*Antechinus flavipes*)
- Common Dunnart (*Sminthopsis murina*)
- * Numbat (*Myrmecobius fasciatus*)

Omniverous Marsupials

- * Southern Brown Bandicoot (*Isodon obesulus*)

Herbiverous Marsupials

- Grey Kangaroo (*Macropus fuliginosus*)
- Brush Wallaby (*Macropus irma*)
- * Tamar Wallaby (*Macropus eugenii*)
- * Woylie (*Bettongia Penicillata*)
- Brush Possum (*Trichosurus vulpecula*)
- * Ringtail Possum (*Pseudocheirus peregrinus*)
- Pygmy Possum (*Cercartetus concinnus*)

Placental Mammals

Southern Bush Rat (*Rattus fuscipes*)
Water Rat (*Hydromys chrysogaster*)
Lesser Long-eared Bat (*Nyctophilus geoffroyi*)
Greater Long-eared Bat (*Nyctophilus major*)
Gould's Long-eared Bat (*Nyctophilus gouldii*)
Gould's Wattle Bat (*Chalinolobus gouldii*)
Chocolate Bat (*Chalinolobus morio*)
Little Bat (*Eptesicus pumulis*)
Tasmanian Pipistrelle (*Pipistrellus tasmaniensis*)
White-striated Bat (*Tadarida australis*)
Little Flat Bat (*Tadarida planiceps*)

Introduced Mammals

Cat (*Felis cattus*)
Dingo (*Canis familiaris*)
Fox (*Vulpes vulpes*)
Mouse (*Mus musculus*)
Rat (*Rattus rattus*)
Rabbit (*Oryctolagus cuniculus*)

* Species which are rare, or otherwise in need of special protection.

Slender Tree Frog (*Litoria adelaidensis*)
 Green & Gold Tree Frog (*Litoria moorei*)
 (*Heleioporus inornatus*)
 Moaning Frog (*Heleioporus eyeri*)
 (*Crinia georgiana*)
 (*Ranidella glauerti*)
 (*Ranidella insignifera*)
 Humming Frog (*Neobatrachus pleobatooides*)

SNAKES

Blind Snake (*Typhlina australis*)
 Dugite (*Demansia nuchalis affinis*)
 Tiger Snake (*Notechis scutatus occidentalis*)
 Little Whip Snake (*Denisonia gouldii*)

LIZARDS

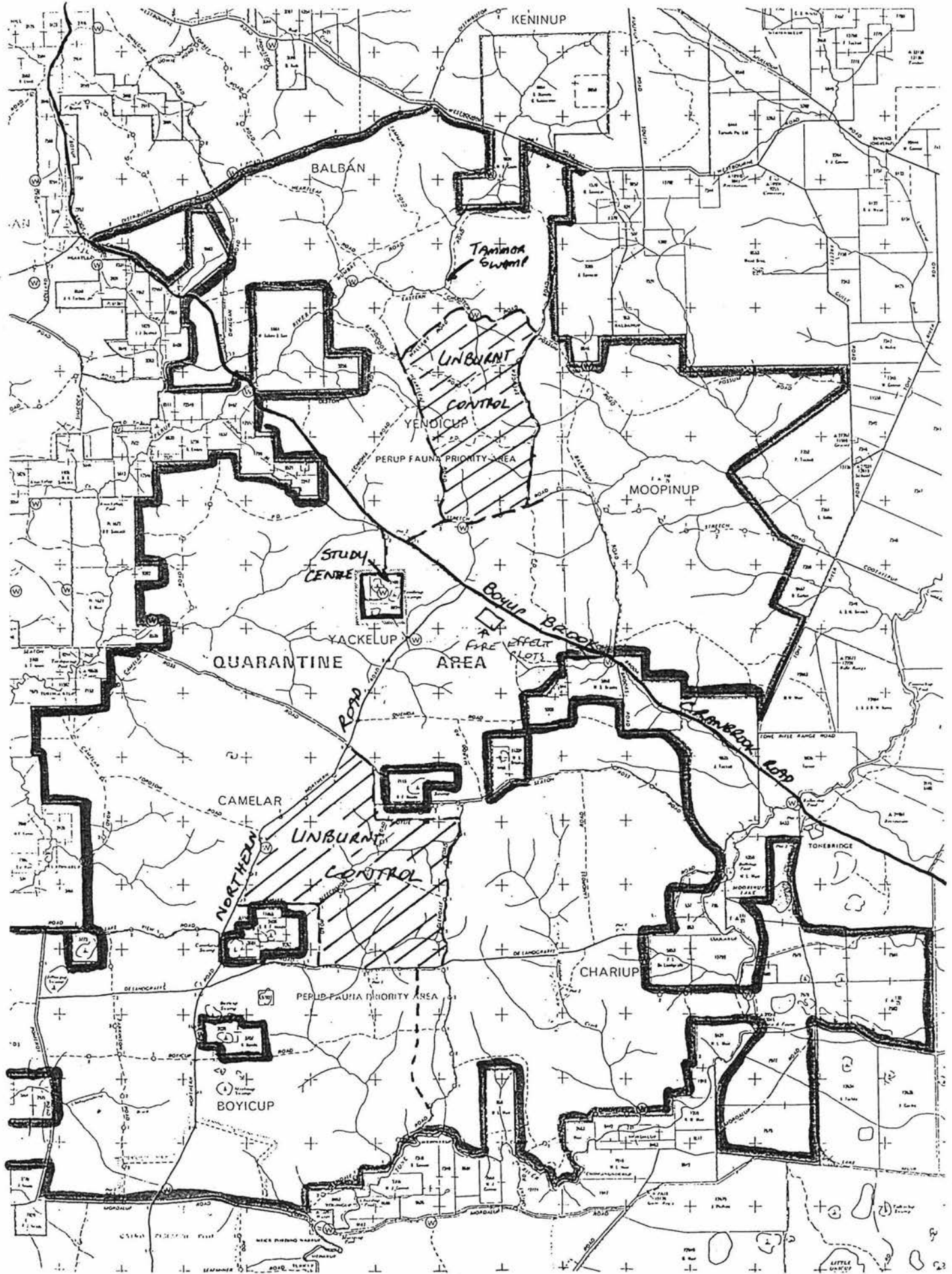
Marbled Gecko (*Phyllodactylus marmoratus*)
 Scale Footed Lizard (*Pygopus lepidopodus*)
 Bobtail (*Tiliqua rugosa*)
 Smith's Skink (*Egernia napoleonis*)
 Red-legged Skink (*Ctenotus labillardieri*)
 Slippery Skink (*Lerista microtis microtis*)
 Burrowing Skink (*Hemiergis peronii peronii*)
 New Holland Skink (*Leiopisma trilineatum*)
 Bungarra (*Varanus gouldii*)

BIRDS

Emu (*Dromaius novaehollandiae*)
 Australian Grebe (*Tachybaptus novaehollandiae*)
 Darter (*Anhinga melanogaster*)
 Little Black Cormorant (*Phalacrocorax sulcirostris*)
 Little Pied Cormorant (*phalacrocorax melanoleucos*)
 Pacific Heron (*Ardea pacifica*)
 White-faced Heron (*Ardea novaehollandiae*)
 Rufous Night Heron (*Nycticorax caladonicus*)
 Black Bittern (*Dupetor flavicollis*)
 Straw-necked Ibis (*Threskiornis spinicollis*)
 Black Swan (*Cygnus atratus*)
 Australian Shelduck (*Tadorna tadornoides*)
 Pacific Black Duck (*Anas superciliosa*)
 Grey Teal (*Anas gibberifrons*)
 Maned Duck (*Chenonetta jubata*)
 Musk Duck (*Biziura lobata*)
 Whistling Kite (*Haliastur sphenurus*)
 Brown Goshawk (*Accipiter cirrhocephalus*)
 Wedge-tailed Eagle (*Aquila audax*)
 Little Eagle (*Hieraaetus morphnoides*)
 Australian Hobby (*Falco longipennis*)
 Brown Falcon (*Falco berigora*)
 Australian Kestrel (*Falco cenchroides*)
 Painted Button-Quail (*Turnix varia*)
 Eurasian Coot (*Fulica atra*)
 Banded Lapwing (*Vanellus tricolor*)
 Black-fronted Plover (*Charadrius melanops*)

Common Bronzewing (*Phaps chalcoptera*)
 Brush Bronzewing (*Phaps elegans*)
 Red-tailed Black-cockatoo (*Calyptorhynchus magnificus*)
 White-tailed Black-cockatoo (*Calyptorhynchus baudinii*)
 Purple-crowned Lorikeet (*Glossopsitta porphyrocephala*)
 Red-capped Parrot (*Purpureicephalus spurius*)
 Western Rosella (*Platycercus isterotis*)
 Port Lincoln Ringneck (*Barnardius zonarius*)
 Elegant Parrot (*Neophema elegans*)
 Pallid Cuckoo (*Cuculus pallidus*)
 Fan-tailed Cuckoo (*Cuculus pyrrhophanus*)
 Shining Bronze-cuckoo (*Chrysococcyx lucidus*)
 Southern Boobook (*Ninox novaehollandiae*)
 Barn Owl (*Tyto alba*)
 Tawny Frogmouth (*Podargus strigoides*)
 Australian Owlet-nightjar (*Aegotheles cristatus*)
 Laughing Kookaburra (*Dacelo novaeguineae*)
 Sacred Kingfisher (*Halcyon sancta*)
 Welcome Swallow (*Hirundo neoxena*)
 Tree Martin (*Ceropis nigricans*)
 Richard's Pipit (*Anthus novaeseelandiae*)
 Black-faced Cuckoo-shrike (*Coracina novaehollandiae*)
 Scarlet Robin (*Petroica multicolor*)
 White-breasted Robin (*Eopsaltria georgiana*)
 Western Yellow Robin (*Eopsaltria griseogularis*)
 * Crested Shrike-tit (*Falcunculus frontatus*)
 Golden Whistler (*Pachycephala pectoralis*)
 Rufous Whistler (*Pachycephala rufiventris*)
 Grey Shrike-thrush (*Colluricincla harmonica*)
 Restless Flycatcher (*Myiagra inquieta*)
 Grey Fantail (*Rhipidura fuliginosa*)
 Willie Wagtail (*Rhipidura leucophrys*)
 Splendid Fairy-wren (*Malurus splendens*)
 Red-winged Fairy-wren (*Malurus elegans*)
 White-browed Scrub-wren (*Sericornis frontalis*)
 Weebill (*Smicronis brevirostris*)
 Western Gerygone (*Gerygone fusca*)
 Inland Thornbill (*Acanthiza apicalis*)
 Western Thornbill (*Acanthiza inornata*)
 Yellow-rumped Thornbill (*Acanthiza chrysorrhoa*)
 Varied Sittella (*Daphoenositta chrysoptera*)
 Rufous Treecreeper (*Climacteris rufa*)
 Red Wattlebird (*Anthochaera carunculata*)
 White-naped Honeyeater (*Melithreptus lunatus*)
 Brown Honeyeater (*Lichmera indistincta*)
 New Holland Honeyeater (*Phylidonyris novaehollandiae*)
 Western Spinebill (*Acanthorhynchus superciliosus*)
 Tawney-crowned Honeyeater (*Phylidonyris melqanops*)
 Singing Honeyeater (*Lichenostomus virescens*)
 Spotted Pardalote (*Pardalotus punctatus*)
 Striated Pardalote (*Pardalotus striatus*)
 Silvereye (*Zosterops lateralis*)
 Australian Magpie-lark (*Grallina cyanoleuca*)
 Dusky Woodswallow (*Artamus cyanopterus*)
 Australian Magpie (*Gymnorhina tibicen*)
 Grey Currawong (*Strepera versicolor*)
 Australian Raven (*Corvus coronoides*)

PERUP NATURE RESERVE

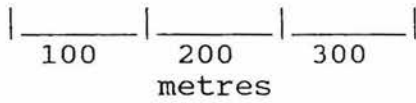


FIRE EFFECTS STUDY AREA - PERUP

Boyup Brook - Cranbrook Road

<- 350 m
to Northern Rd

1. SUMMER NORMAL	2. SUMMER HALF	3. CONTROL NO BURN	4. SPRING NORMAL
5. SPRING NORMAL	6. CONTROL NO BURN	7. ONCE ONLY BURN	8. SRPING DOUBLE
9. ONCE ONLY BURN	10. SUMMER HALF	11. SPRING DOUBLE	12. SUMMER NORMAL



NOTES

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